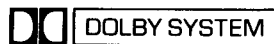


Service Manual

Cassette Deck

RS-641

Front-Loading Vertical Hold High Fidelity Stereo
Cassette Deck with Memory Auto Play and Separate
3-Position Bias/Equalization Selectors



RS-631 MECHANISM SERIES

Specifications (Catalog specifications for sales)

Power requirement:	AC; 110/125/220/240V, 50/60Hz	Input:	MIC; sensitivity 0.25 mV, input impedance 10 K Ω , applicable microphone impedance 400 Ω ~20 K Ω
Power consumption:	30 W (for European areas and Australia) 11 W (for PX and other area without European areas and Australia)	Output:	LINE; sensitivity 60 mV, input impedance 33 K Ω LINE; output level 420 mV, output impedance 1 K Ω or less, load impedance 47 K Ω over HEADPHONE; output level 60 mV, load impedance 8 Ω
Motor:	FG servo DC motor	Rec/pb connection:	5P DIN type; input sensitivity 0.26 mV, impedance 1.5 K Ω , output level 420 mV, impedance 10 K Ω
Track system:	4-track 2-channel stereo recording and playback	Bias frequency:	83 kHz
Tape speed:	4.8 cm/s, (1-7/8 ips.)	Head:	2-head system 1-HPF head for record/playback 1-doubl-gap ferrite head for erasure
Wow and flutter:	0.05% (WRMS), 0.15% (DIN)	Dimensions:	43.0 cm(W) $\times$ 14.9 cm(H) $\times$ 26.7 cm(D) [17"(W) $\times$ 5-7/8"(H) $\times$ 10-1/2"(D)] for all of areas without PX 15.8 cm(H) $\times$ 46.6 cm(W) $\times$ 26.7 cm(D) [6-1/2"(H) $\times$ 18-3/8"(W) $\times$ 10-1/2"(D)] for PX
Frequency response:	CrO ₂ /FeCr tape; 25~16,000Hz 30~15,000Hz (DIN) 40~14,000Hz $\pm$ 3 dB Normal tape; 25~14,000Hz 30~13,000Hz (DIN) 40~12,000Hz $\pm$ 3 dB	Weight:	7.6 kg for European areas 7.8 kg (16 lbs 5 oz) for other area without European areas 9 kg (19 lbs 14 oz) for PX
Signal-to-noise ratio:	Dolby* NR in; 67 dB (above 5 kHz) Dolby NR out; 57 dB (signal=max. recording level, FeCr/CrO ₂ type tape)		
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape		

Specifications are subject to change without notice.

*'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS

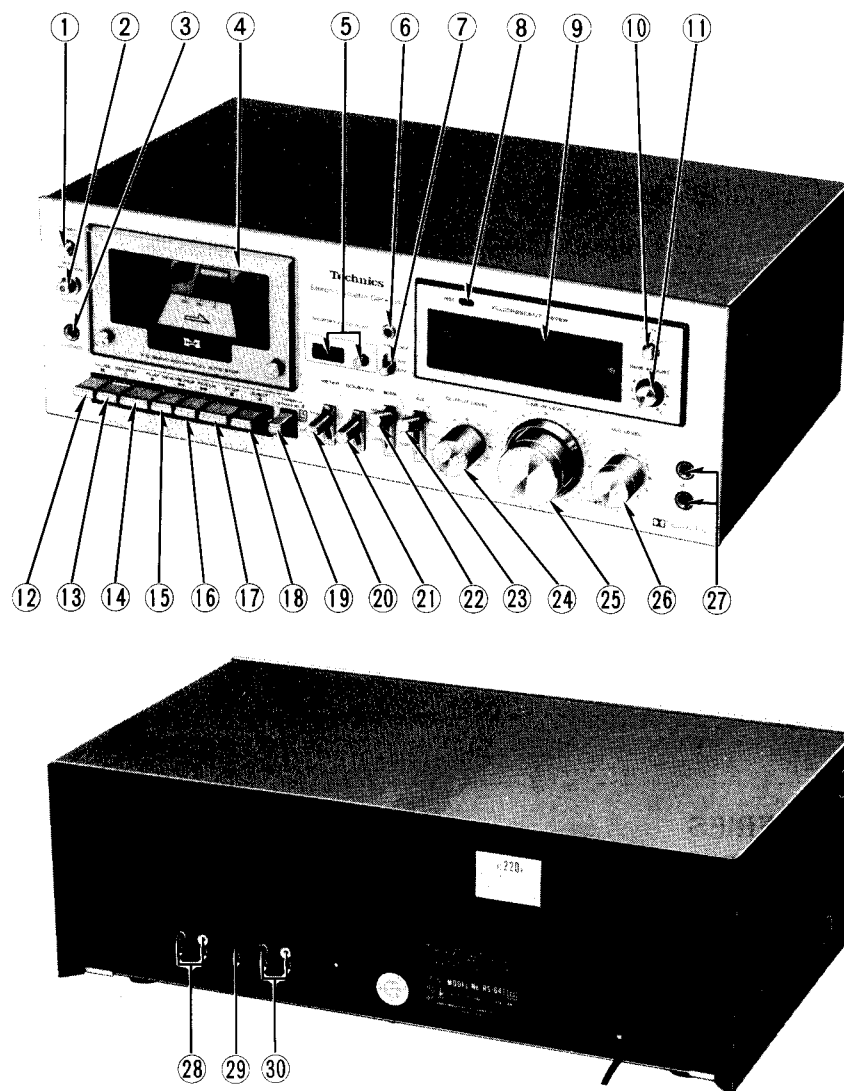


Fig. 1

- | | |
|---------------------------------|-------------------------------------|
| ① Power switch | ⑩ Meter brightness switch |
| ② Music selector | ⑪ Bias adjustment control |
| ③ Headphones jack | ⑫ Pause button |
| ④ Cassette compartment door | ⑬ Record button |
| ⑤ Tape counter and reset button | ⑭ Playback button |
| ⑥ Memory indication lamp | ⑮ Rewind/review button |
| ⑦ Memory switch | ⑯ Fast forward/cue button |
| ⑧ Recording indication lamp | ⑰ Stop button |
| ⑨ Fluorescent level meters | ⑱ Eject button |
| ⑫ Pause button | ⑲ Timer stand-by button |
| ⑬ Record button | ⑳ Peak-signal-check switch |
| ⑭ Playback button | ㉑ Dolby noise-reduction switch |
| ⑮ Rewind/review button | ㉒ Bias selector |
| | ㉓ Equalization selector |
| | ㉔ Output level control |
| | ㉕ Line input level controls |
| | ㉖ Microphone level controls |
| | ㉗ Microphone jacks |
| | ㉘ Line output jacks |
| | ㉙ Record/playback connection socket |
| | ㉚ Line input jacks |

DISASSEMBLY INSTRUCTIONS

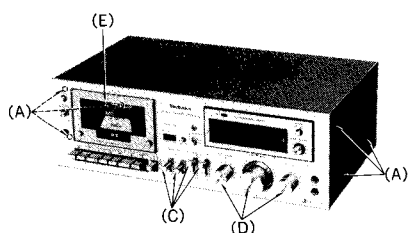
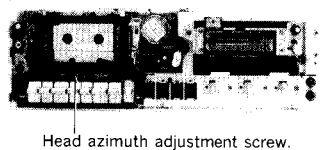


Fig. 2



Head azimuth adjustment screw.

Fig. 3

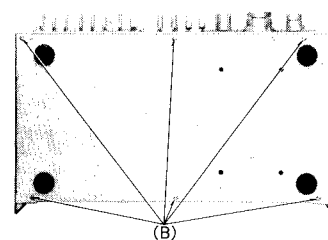


Fig. 4

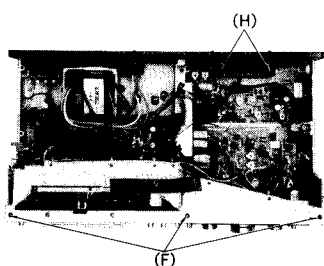


Fig. 5

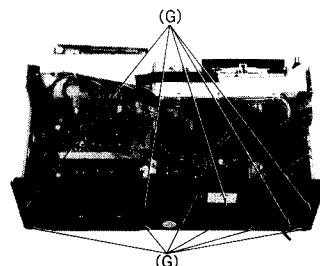


Fig. 6

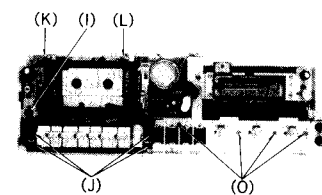


Fig. 7

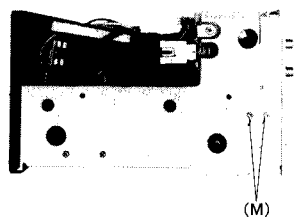


Fig. 8



Fig. 9

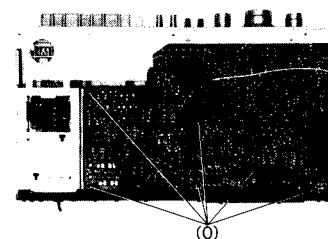


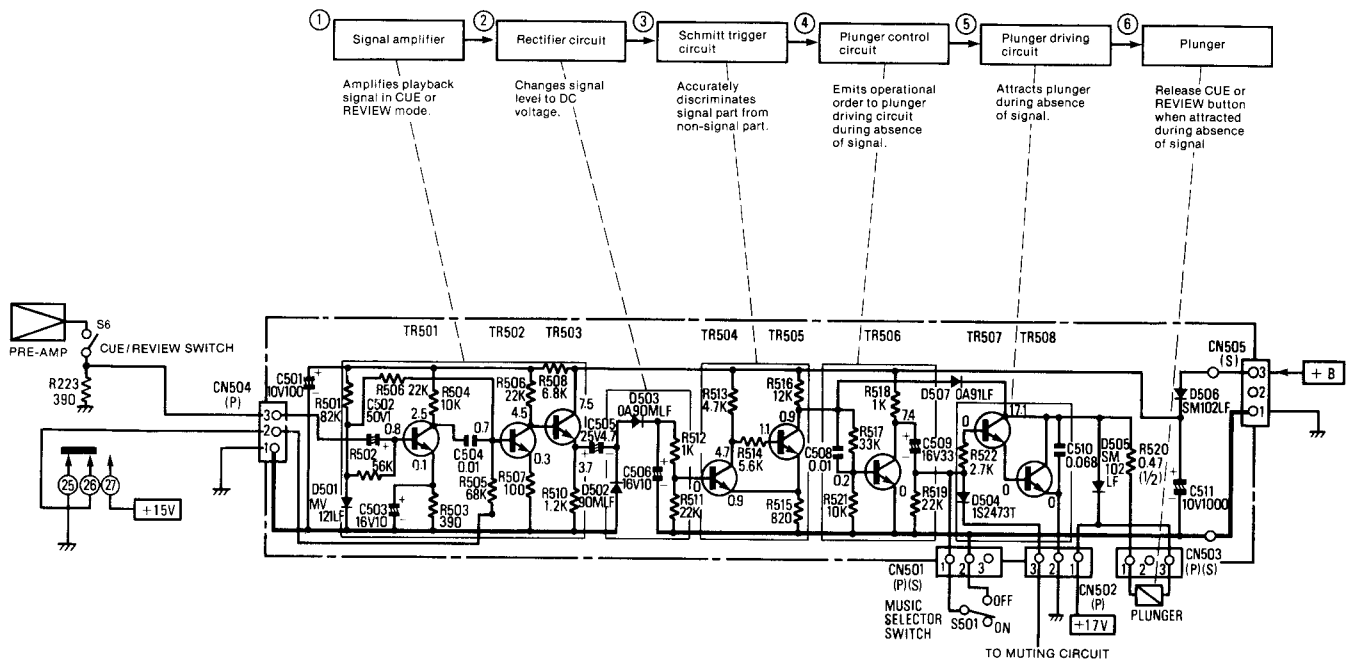
Fig. 10

Procedure	To remove —	Remove —	Shown in fig. —
1	Case cover	• 6 black screws (A)	2
2	Bottom cover	• 6 screws (B)	4
3	Front panel	• 4 lever knobs (C) • 3 control knobs (D) • Cassette lid (E) ※ • 3 red screws (F)	2 2 2, 3 5
3	Rear board	• 11 black screws (G) • 2 red screws (H)	6 5
5	Control button assembly and cassette holder	• Headphones jack cover (I) • 4 red screws (J) • Stop ring (K) • Cassette holder spring (L)	7 7 7 7
6	Mechanism	• 2 headphones jack holding screw ... (M) • 6 red screws (N)	8 9
6	Main amplifier	• 10 red screws (O)	7, 10

※ The head azimuth can be adjusted by removing the cassette lid (E) as shown in fig. 3.

TECHNICAL EXPLANATION FOR MUSIC SELECTOR CIRCUIT

The tune selector circuit serves to automatically find the starting point of the desired tune on the tape. When the music selector button is pressed during CUE or REVIEW operation, the first unrecorded portion of the tape is accurately detected and the playback of the selected tune is automatically started at the beginning of the music signal part.



Operation

1. Set the tune selector to ON.
2. Depress the PLAYBACK button and REVIEW/REWIND (or FF/CUE) button simultaneously.
3. When the tape reaches a portion where there is no signal, the REWIND/REVIEW (or FF/CUE) button is released and the tape is automatically played back.

Principle of operation

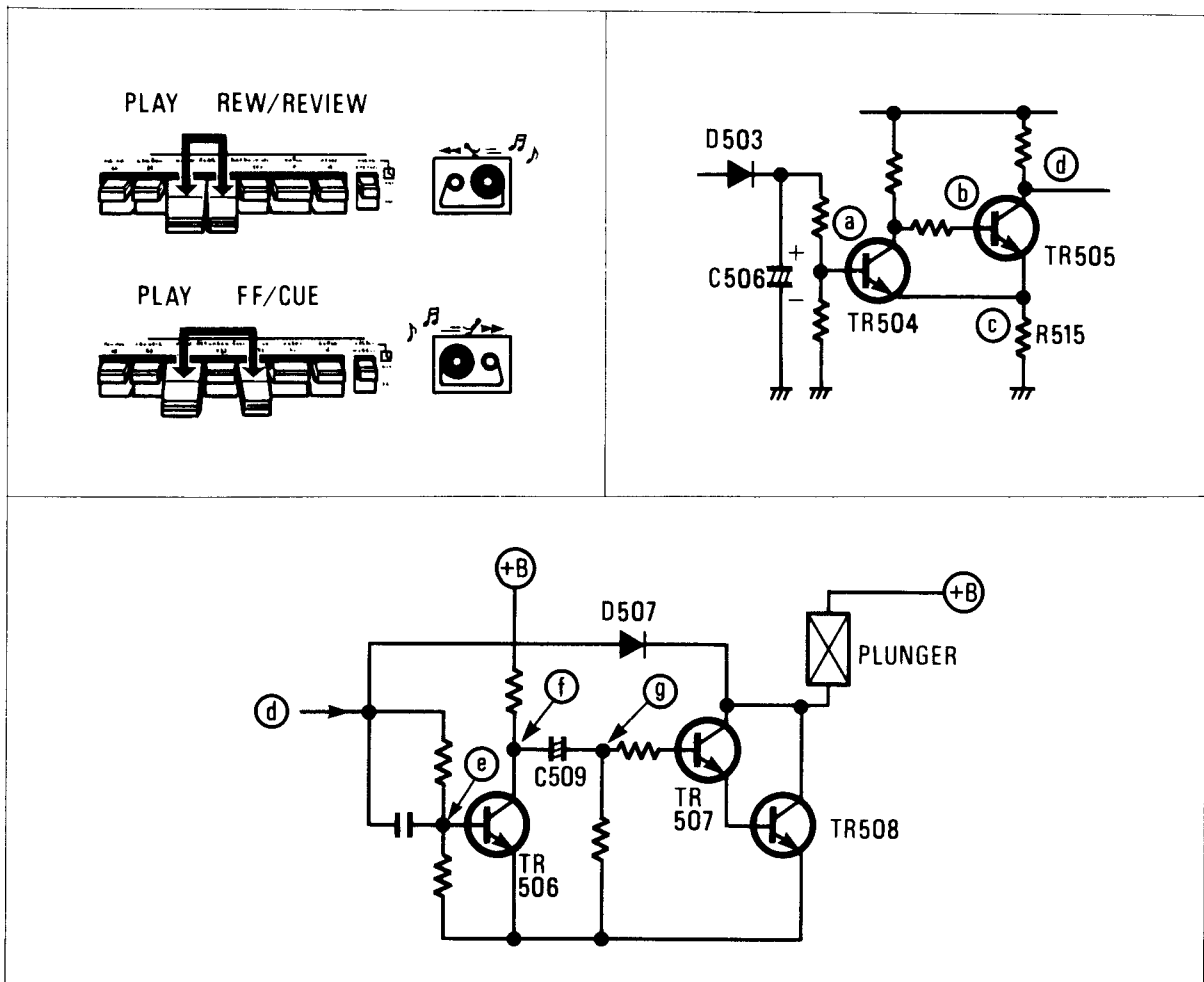
1. When CUE or REVIEW is operated, the signal from the pre-amplifier is applied to the base of TR501. (The signal is taken out as a monaural signal.)
2. The voltage is amplified by TR501, 502, 503.
3. The signal from the emitter of TR503 is rectified by D502 and D503. Therefore, the voltage applied to the base of TR504 increases during presence of signal, and decreases during absence of signal.
4. TR504, 505 form the schmitt trigger circuit.
 - 1) TR504 and TR505
TR504, 505 use R515 as their common emitter resistor.
 - 2) During presence of signal, the potential at (a) increases, therefore TR504 turns ON and TR505 turns OFF because of Low potential at (b), and the potential at (d) increases.
 - 3) During absence of signal, the potential at (a) decreases. When the potential at (b) becomes higher than that at (c), TR505 turns ON and TR504 turns OFF, and the potential at (d) decreases.
 - 4) Therefore, when the playback signal condition changes from presence to "absence" during CUE or REVIEW mode, the potential at (d) changes from "H" to "L".

5. TR506, 507, 508 serve to control and drive the plunger.

When the potential at ④ is "High", the potential at ⑤ increases and TR506 turns ON, and the potential at ⑥ decreases. Therefore TR507 and TR508 turns OFF.

When the potential at ④ changes from "High" to "Low", the potential at ⑤ decreases and TR506 turns OFF and the potential at ⑥ increases. Then the charging of C509 is started. At that time, the potential at ⑧ also increases. Therefore, TR507 turns ON, followed by TR508, thus causing the plunger to be attracted.

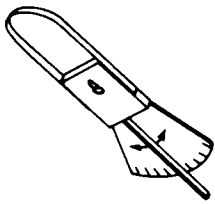
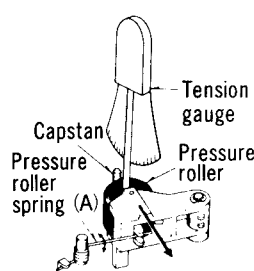
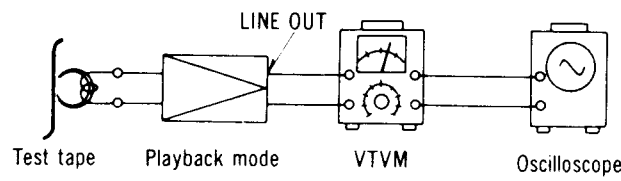
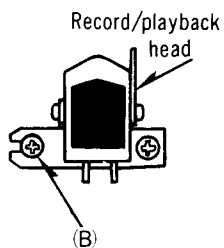
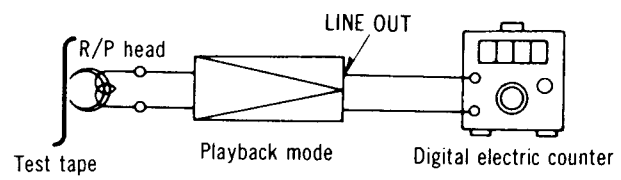
The plunger is attracted only while C509 is being charged. When C509 has been completely charged, the potential at ⑧ decreases and the plunger will be released.

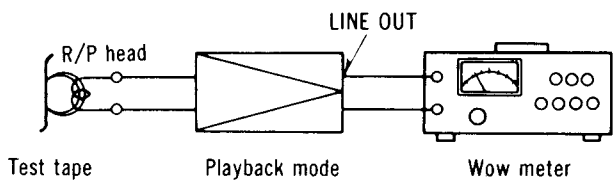


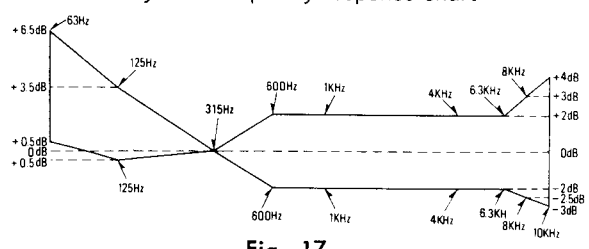
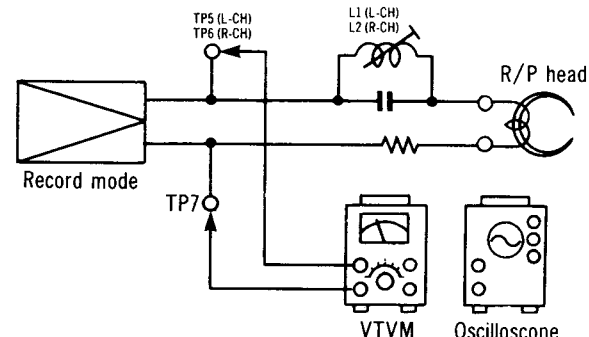
MEASUREMENT AND ADJUSTMENT METHOD

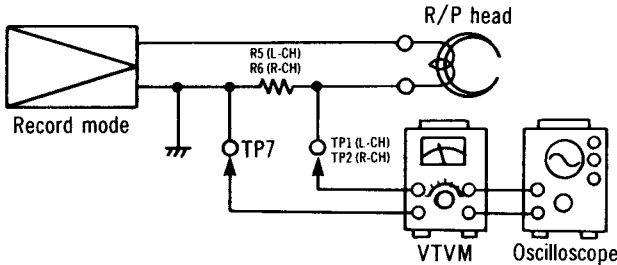
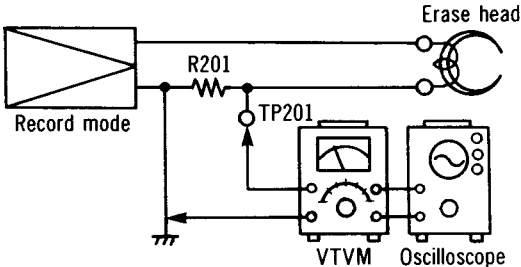
NOTE:

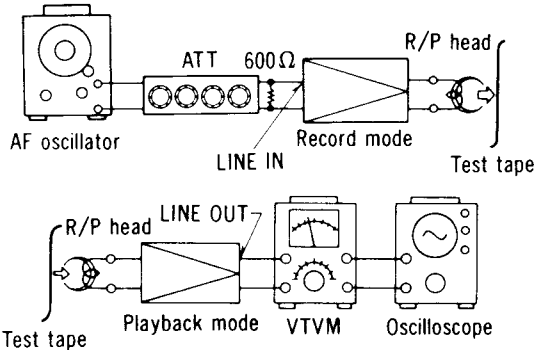
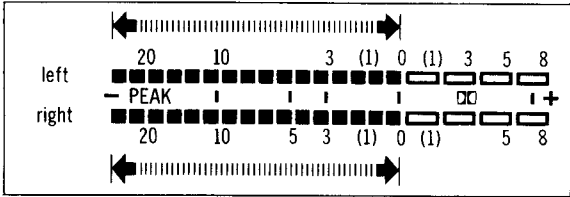
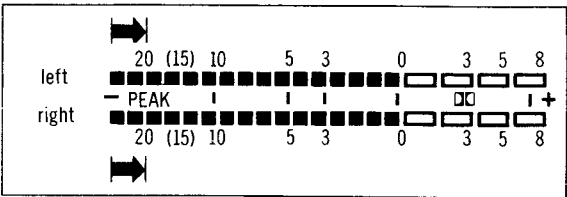
1. Make sure heads are clean.
2. Make sure capstan and pressure roller are clean.
3. Judgeable room temperature: $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$).
4. Dolby NR switch: OUT.
5. Bias selector: LOW.
6. Equalizer selector: $120\mu\text{S}$.
7. Bias adjustment control: Center.
8. Peak check switch: OUT.

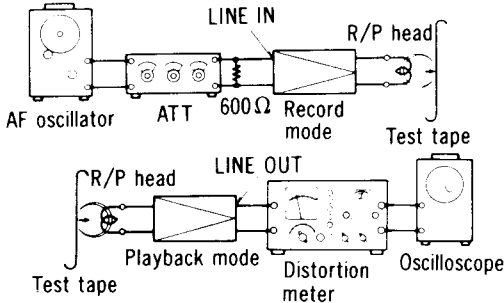
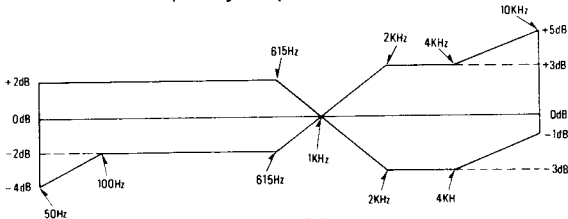
ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Pressure of pressure roller Equipment: * Tension gauge (max. 500 gr)  Fig. 11	- Place UNIT into playback mode. - Hook the tension gauge to pressure roller lever and pull it in the direction of the arrow as shown in fig. 12. - Measure the tension at the moment when the pressure roller moves away from the capstan. Standard value: 400 ± 50 gr Adjustment method Bend the part (A) of the pressure roller spring in either direction shown by the arrow until the correct pressure is attained.	* Playback mode  Fig. 12
Takeup tension Equipment: * Cassette torque meter ...QZZSRKCT	- Mount cassette torque meter on UNIT. - Place UNIT into playback mode and read takeup torque. - Measure several times and determine the mean value. Standard value: 50 ± 15 gr-cm	* Playback mode
Head azimuth adjustment Equipment: * VTVM * Oscilloscope * Test tape (azimuth) ...QZZCFM	Record/playback head adjustment - Test equipment connection is shown below.  Fig. 13 - Play azimuth tape (QZZCFM 8kHz) - Adjust record/playback head angle adjustment screw (B) in fig. 14 so that output level at LINE OUT becomes maximum. - Measure both channels, and adjust levels for equal output. - After adjustment lock head adjustment screw with lacquer.	* Playback mode  Fig. 14
Tape speed Equipment: * Digital electronic counter or frequency counter (RP8067) * Test tape...QZZCWAT	Tape speed accuracy Test equipment connection is shown below.  Fig. 15	* Playback mode

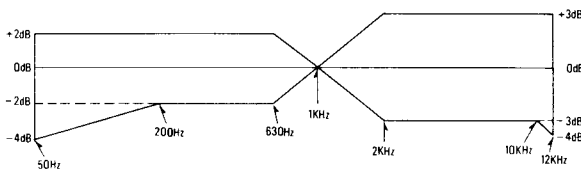
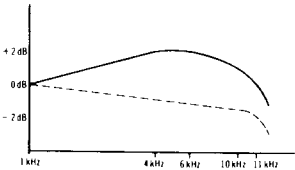
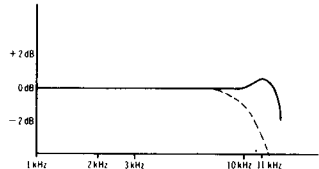
ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
	- Play test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter. - Measure this frequency. - On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%)$ where, f = measured value - Take measurement at middle section of tape. Standard value: $\pm 1.5\%$ Adjustment method - Play the test tape (middle). - Adjust VR201 so that frequency becomes 3,000Hz. Tape speed fluctuation Make measurements in same manner as above (beginning, middle and end of tape), and determine difference between maximum and minimum values and calculate as follows: $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ f₁ = maximum value f₂ = minimum value Standard value: 1%	
Wow and flutter Equipment: - Wow meter - Test tape...QZZCWAT	- Test equipment connection is shown below.  The diagram illustrates the setup for measuring wow and flutter. On the left, a 'Test tape' is shown with an 'R/P head' (Read/Play head) positioned over it. A cable connects the head to a central rectangular unit labeled 'Playback mode'. From the right side of this unit, a cable labeled 'LINE OUT' connects to a 'Wow meter'. The wow meter is depicted with a scale and several control buttons. Fig. 16 - Use wow test tape (3,000Hz) and measure its playback signal on wow meter. - Wow and flutter is expressed in percentage and that measurement can be weighted by JIS network (WRMS). - Measure at middle section of test tape. Standard value: 0.1% (WRMS)	Playback mode
Playback frequency response Equipment: - VTVM - Oscilloscope - Test tape...QZZCFM	- Test equipment connection is as same as "Head azimuth adjustment" but use the test tape instead of head azimuth tape (See fig. 17). - Place UNIT into playback mode. - Playback frequency response test tape. - Measure output level at 8kHz, 4kHz, 1kHz, 315 Hz, 250 Hz, 125 Hz and 63Hz, and compare each output level with standard frequency 315Hz, at LINE OUT. - Make measurement for both channels. - Make sure that the measured value is within the range specified in the frequency response chart.	- Playback mode - Output level control ... MAX

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
	Playback frequency response chart  Fig. 17 Adjustment method If the measured value is not standard, adjust VR1 (L-CH), VR2 (R-CH).	
Playback gain Equipment: * VTVM * Oscilloscope * Test tape... QZZCFM	- Test equipment connection is shown in fig. 13. - Play standard recording level portion on test tape (QZZCFM 315Hz), and using VTVM measure the output level at LINE OUT jack. - Make measurement for both channels. Standard value: 0.39 V Adjustment method - If measured value is not standard, adjust VR3 (L-CH), VR4 (R-CH) (See fig. 28 on page 12). - After adjustment, check "Playback frequency response" again.	* Playback mode * Output level control ... MAX
Playback S/N ratio Equipment: * VTVM * Oscilloscope * Test tape... QZZCFM * Empty cassette	- Test equipment connection is shown in fig. 13. - Play standard recording level test tape (QZZCFM 315Hz) and read output level on VTVM. Refer to "Playback gain adjustment". - Place empty cassette (which has been cut) and playback again. - Measure noise level at this time using VTVM, and determine ratio of this level to test tape output signal voltage (315Hz). Standard value: Greater than 43 dB	* Playback mode * Output level control ... MAX
Bias leak Equipment: * VTVM * Oscilloscope	- Test equipment connection is shown below.  Fig. 18 - Place UNIT into record mode. - Adjust trap coil L1 (L-CH), L2 (R-CH), so that measured value on VTVM becomes minimum. - Take adjustment for both channels.	* Record mode

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Bias current Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown below.  Fig. 19 2. Place UNIT into record mode, and bias selector to "LOW". 3. Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$ 4. Adjust VR15 (L-CH) and VR16 (R-CH) (See adjustment part location on page 12). 5. Then, change bias selector to "HIGH" and measure bias current. 6. If measured value is not within standard, adjust VR605. Standard value: 190μA (LOW position) 195μA $\pm$ 20μA (MED position) 255μA $\pm$ 30μA (HIGH position)	* Record mode * When bias current is adjusted on one channel only, note that bias current on the other channel may vary.
Erase current Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown below.  Fig. 20 2. Place UNIT into record mode and set the bias selector to LOW position. 3. Read voltage on VTVM and calculate erase current by following formula: $\text{Erase current (A)} = \frac{\text{Value read on VTVM (V)}}{1 (\Omega)}$ Standard value: More than 40 mA (Normal) More than 45 mA (FeCr) More than 55 mA (CrO₂)	* Record mode * Bias selector ... LOW

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Overall gain Equipment: * AF oscillator * VTVM * ATT * Oscilloscope * Test tape (reference blank tape) ... QZZCRA for Normal	1. Test equipment connection is shown in fig. 21.  Fig. 21 2. Place UNIT into record mode, and equalizer selector to $120\mu\text{S}$, bias selector to LOW (for normal tape). 3. Supply 1 kHz signal (-24 dB) from AF oscillator, through ATT, to LINE IN. 4. Adjust ATT until monitor level at LINE OUT becomes 0.39 V. 5. Using test tape, make recording. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.39 V. 7. If measured value is not 0.39 V, adjust VR9 (L-CH), VR10 (R-CH) (See fig. 28 on page 12). 8. Repeat from step (2).	* Record/playback mode * LINE IN level control ... MAX * Output level control ... MAX * Standard input level: MIC $-72 \pm 3\text{ dB}$ LINE IN ... $-24 \pm 3\text{ dB}$ DIN $-36 \pm 3\text{ dB}$ * Bias adjustment control ... Center
Fluorescent meter Equipment: * VTVM * AF oscillator * ATT	1. Test equipment connection is shown in fig. 21. 2. Set the meter brightness switch to "BRIGHT" position. 3. Supply 1 kHz signal (-24 dB) to the LINE IN jack, then press the record button. 4. Adjust the ATT so that the output level at LINE OUT jack becomes 0.66 V. (= standard input level). 5. Adjustment at "0 dB".  Fig. 22 A. Adjust VR603 (L-CH) and VR604 (R-CH) so that the Fluorescent meters show an illuminated indication up to "0 dB" when the input signal level is 0.9 dB higher than the standard input level. B. Then confirm that the Fluorescent meters show an illuminated indication up to "+1 dB" when the input signal level is 1.0 dB higher than the standard input level. 6. Adjustment at "-20 dB"  Fig. 22-1	* Record mode * Mic level control MIN. * LINE IN level control ... MAX. * Output level control ... MAX. * Tape selectors ... normal position

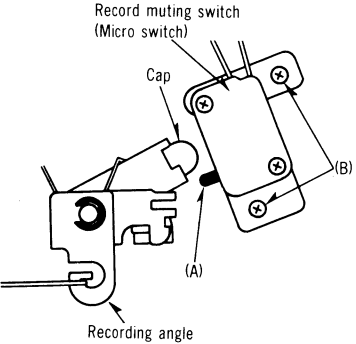
ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
	A. Adjust VR601 (L-CH) and VR602 (R-CH) so that the Fluorescent meters show an illuminated indication up to "−20 dB" when the input signal level is 15.1 dB lower than the standard input level. B. Then confirm that the Fluorescent meters show an illuminated indication up to "−15 dB" when the input signal level is 15.0 dB lower than the standard input level.	
Overall distortion Equipment: • Distortion meter • AF oscillator • ATT • Oscilloscope • Test tape (reference blank tape) ... QZZCRA for Normal ... QZZCRX for CrO ₂	1. Test equipment connection is shown in fig. 23.  Fig. 23 2. Supply 1kHz signal to LINE IN and adjust ATT so that output level at LINE OUT indicates 0.39 V. 3. Make recording. 4. Playback and measure distortion factor of output signal. 5. When the distortion factor does not satisfy the standard, check the bias current. When the bias current is lower than standard, distortion will increase. Care should be exercised in the adjustment because the bias current also has an influence on the overall frequency response. Refer to "The overall frequency response" and "The bias current adjustment". Standard value: Less than 2.5% (Normal) Less than 4.0% (CrO₂)	• Record/playback mode • LINE IN level control ... MAX • Output level control ... MAX
Overall frequency response Equipment: • VTVM • AF oscillator • ATT • Test tape (reference blank tape) ... QZZCRA for Normal ... QZZCRX for CrO ₂ ... QZZCRY for FeCr	Note: Before measuring, and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response). 1. Test equipment connection is shown in fig. 21. 2. Load reference blank test tape and place UNIT into record mode. 3. Supply 1kHz signal from AF oscillator through ATT to LINE IN. 4. Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU). 5. At this time, LINE OUT level indicates 0.039 V. 6. Record each frequency 50 Hz, 100 Hz, 200 Hz, 1 kHz, 2 kHz, 4 kHz and 10 kHz (12 kHz for CrO₂ tape) at the same level. 7. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz. 8. Make sure that the measured value is within the range specified in the overall frequency response chart. Overall frequency response chart (Normal)  Fig. 24	• Record/playback mode • LINE IN level control ... MAX • Output level control ... MAX

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
	9. Set the bias selector to CrO₂ position. 10. Measure as same as manner above. 11. Make sure that the measured value is within the range specified in the overall frequency response chart for CrO₂ tape below. Overall frequency response chart (CrO₂, FeCr)  Fig. 25	
Overall frequency response adjustment (As a standard for adjustment)	Adjustment 1—Using bias current - When the frequency response between the middle- and high-frequency range becomes higher than the standard value, as shown by the solid line in fig. 26, increase the bias current by turning VR15 (L-CH), VR16 (R-CH) for normal tape and VR605 for CrO₂ tape. - When it becomes lower, as shown by dotted line, reduce the bias current by turning VR15 (L-CH), VR16 (R-CH) for normal tape and VR605 for CrO₂ tape. Note: - For adjustment when the bias current is lower than the standard value use the procedure indicated in adjustment 2, because reducing the bias current beyond this point may worsen the distortion factor. - For the method of bias current measurement, refer to "Bias current adjustment" on page 6.  Fig. 26 Adjustment 2—Using the peaking coil for recording equalization When the frequency response is flat in the middle-frequency range and makes a sharp rise or drop in the high-frequency range, as shown in fig. 27, adjust by turning the peaking coil L3 (L-CH), L4 (R-CH) for normal tape recording equalization.  Fig. 27	
Dolby NR circuit Equipment: * VTVM * AF oscillator * ATT * Oscilloscope	- Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5dB at TP3 (L-CH), TP4 (R-CH) (frequency 5 kHz). - Confirm that the value at IN position is 8(±2.5)dB greater than the value at OUT position of Dolby NR switch.	* Record mode * LINE IN level control ... MAX

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Overall S/N ratio Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Test tape (reference blank tape) ... QZZCRA	1. Test equipment connection is shown in fig. 21. 2. Supply 1kHz signal to LINE IN and adjust ATT so that output level at LINE OUT indicates 0.39 V. 3. Make recording. 4. Make another recording without supplying signal (disconnect input plug to LINE IN). 5. Rewind to recorded part and playback. 6. Measure output signal level and no signal level (noise), and determine the ratio in decibels (dB). 7. The value is difference between "Playback S/N and overall S/N", but for decibel calculation refer to "Playback S/N measurement" on page 5. Standard value: Greater than 43dB (without NAB filter)	* Record/playback mode * LINE IN level control ... MAX * Output level control ... MAX * Erase the tape with a bulk tape eraser.

HOW TO INSTALL THE RECORD-MUTING SWITCH

- 1. Lock the record button, and then mount it with screw (B) so that the cap and micro switch (A) do not contact each other.
- 2. Then play the music tape. During the playback, press the record button lightly several times, confirm whether the playback sound is interrupted or not.



ADJUSTMENT PARTS LOCATION

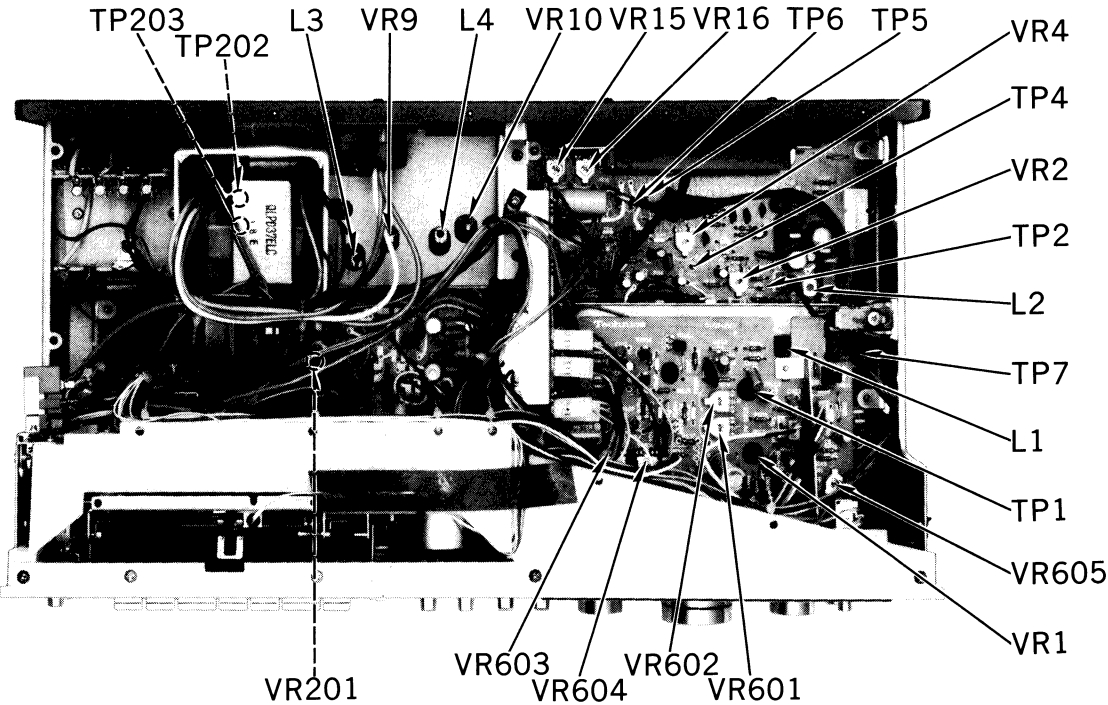
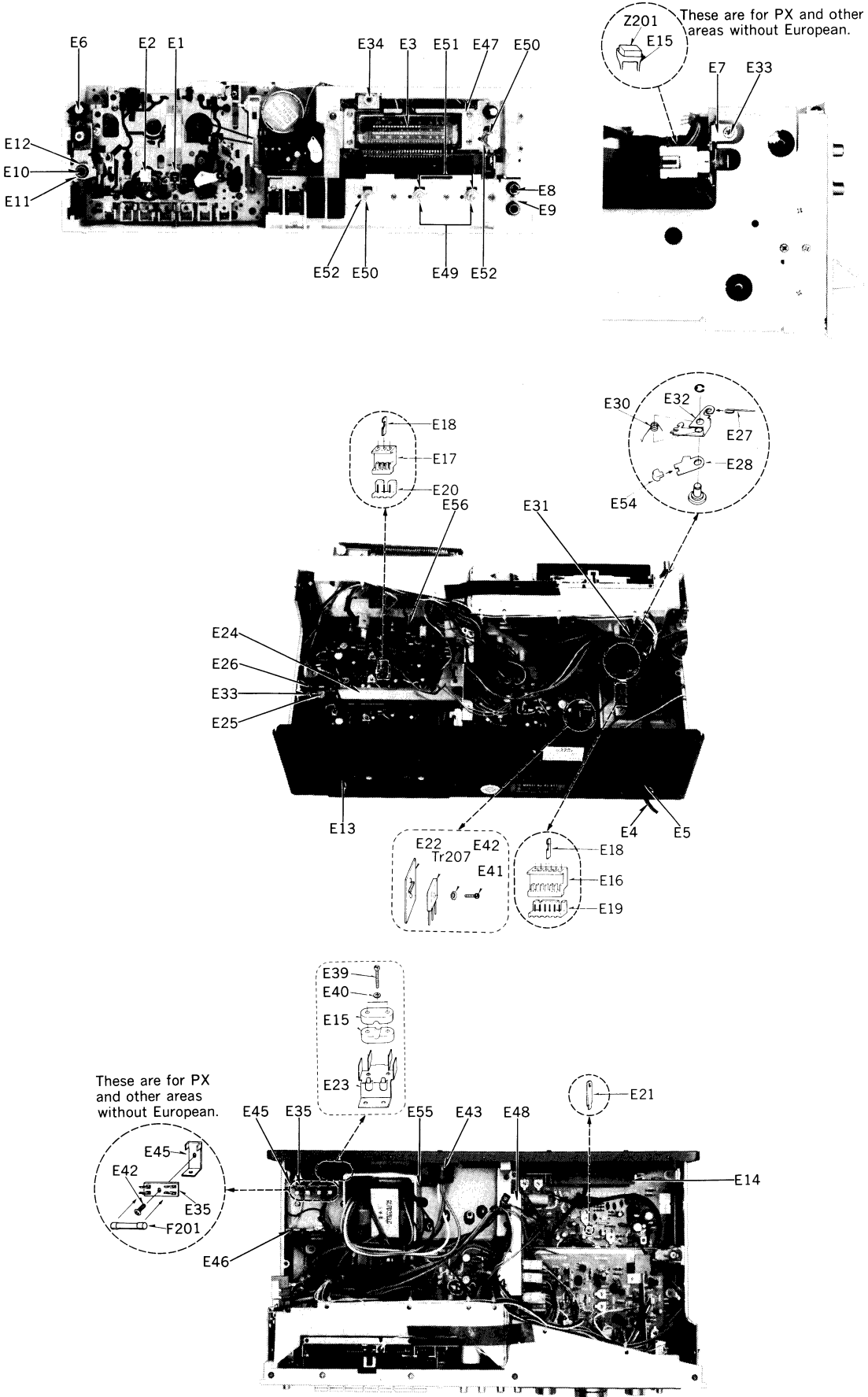


Fig. 28

NOTE: 1. Symbols after Ref. No. indicate:
●.....for United Kingdom
○.....for Australia
□.....for other European areas
2. ■ indicated that only parts specified by the manufacturer be used for safety.

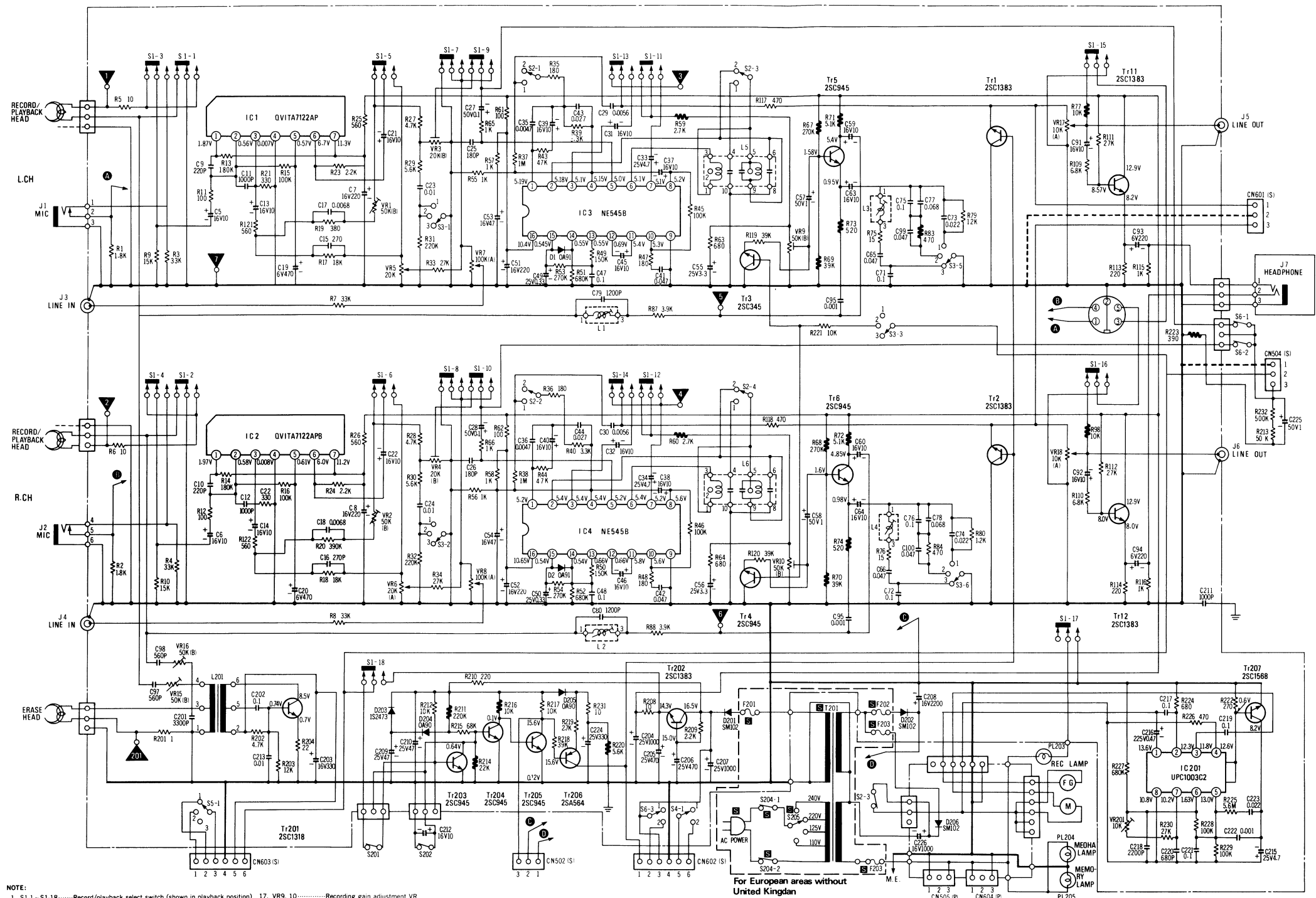
Ref. No.	Part No.	Part Name & Description
ELECTRICAL PARTS		
E1	WY456Z	Record/Playback Head
E1	WY1422Z	"
E2	QWY2122ZA	Erase Head
E3	QSL5001RFA	Fluorescent Meter
E4	QFC1204M	AC Power Cord
E4	QFC1208M	"
E4	QFC1200M	AC Power Cord (for PACEX)
E4	QFC1203M	AC Power Cord (for AAFES)
E4	QFC1205M	AC Power Cord
E5	QBJ1425	Power Cord Bushing
E6	QXB0531	Push Switch Button (Power Switch)
E6	QXB0499	"
E7	QMA3204	Power Switch Angle
E8	QJA0444H	Microphone Jack
E9	QMA3229	Microphone Jack Angle
E10	QJA0249H	Headphones Jack
E11	QMA3328	Headphones Jack Angle
E12	QNQ1070	Nut
E13	QEJ5002HA	Jack Board Assembly
E14	QMA3207	Jack Board Angle
E15	QTD1164	Power Cord Clamper
E16	QJS1922TN	6 Pin Housing
E17	QJS1921TN	3 Pin Housing
E18	QJT1054	Contact
E19	QJP1922TN	6 Pin Post
E20	QJP1921TN	3 Pin Post
E21	QJT1041	Check Pin
E22	QTH1118	Heat Sink
E23	QMA3370	Cord Angle
E24	QMA3202	Switch Lever
E25	QMA3208	Friction Metal
E26	QBT1787	Lock Lever Spring
E27	QBS1115	Recording Connection Wire
E28	QMA3247	Muting Detection Lever
E29	QMF1692	Panel Holding Plate
E30	QBN155B	Muting Return Spring
E31	QMA3257	Micro Switch Holding Plate
E32	QMA3203	Recording Angle
E33	XSNQ0004S	Step Screw
E34	QBG1222	Pilot Lamp Cover
E35	QTF1039	Fuse Holder
E35	QTF1049	"
E39	XSN3+25S	Screw 3×25
E40	XWA3B	Spring Washer 3φ
E41	XSN26+6	Screw 2.6×6
E42	XWC26B	Lock Washer 2.6φ
E43	RUV387ZB	Switch Cover
E44	QTW1118	Spark Killer Cover
E45	QMA3418	Fuse Angle
E45	QMA3492	"
E46	RJR222B	Lug Terminal
E47	QMA3356	Meter Holding Angle
E48	QMA3277	Playback Holding Angle
E49	QNQ1039	Nut 9φ
E50	QNQ1004	Nut 8φ
E51	QWQ1133	Washer 9φ
E52	QWQ2002	Washer 8φ
E53	XSN4+8S	Screw 4×8
E54	QKJ0218	Cap
E55	QMA3371	Trans Angle
E56	QMA3206	Volume Angle

ELECTRICAL PARTS LOCATION

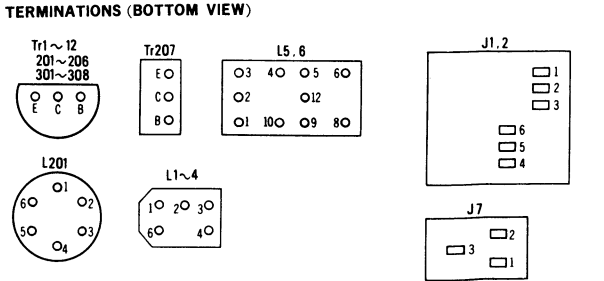
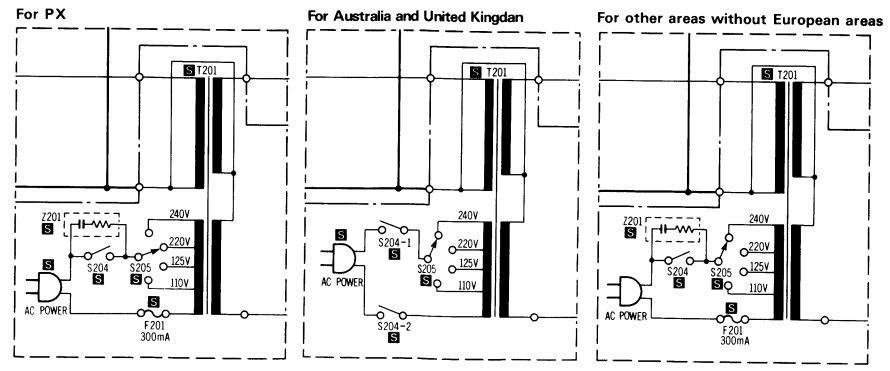
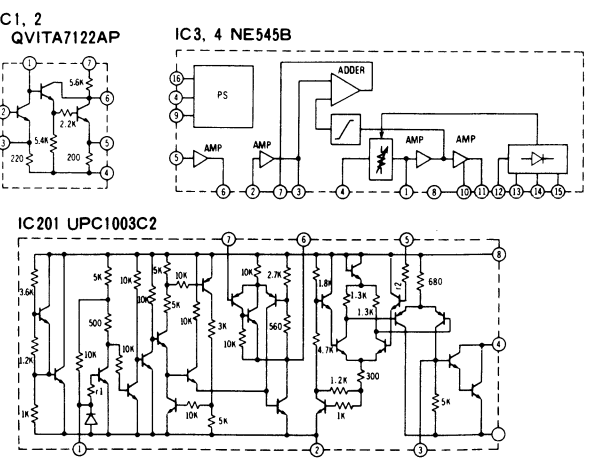


SCHEMATIC DIAGRAM MODEL RS-641

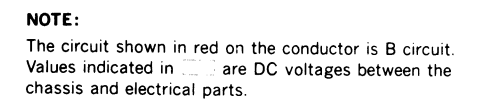
Main Amp Section



- NOTE:**
- S1-1~S1-18: Record/playback select switch (shown in playback position).
 - S2-1~S2-4: Dolby NR IN/OUT select switch (shown in OUT position).
 - S3-1~S3-6: Equalizer select switch (shown in 120μS position).
 - S4-1~S4-3: Peak check select switch (shown in IND position).
 - S5: Bias select switch (shown in LOW position).
 - S6-1, S6-2: Cue and review switch.
 - S201: Muting switch for record and playback.
 - S202: Muting switch for record.
 - S203: Motor ON/OFF switch.
 - S204: Power ON/OFF switch.
 - S205: Voltage select switch.
 - S601: Bright switch.
 - VR1, 2: Playback equalizer adjustment VR.
 - VR3, 4: Playback gain adjustment VR.
 - VR5, 6: Microphone input level control.
 - VR7, 8: LINE IN input level control.
 - VR9, 10: Recording gain adjustment VR.
 - VR15, 16: Bias current adjustment VR (for normal tape).
 - VR17, 18: Output level control.
 - VR201: Tape speed adjustment VR.
 - VR601, 602: Fluorescent meter adjustment VR (for -20dB indication).
 - VR603, 604: Fluorescent meter adjustment VR (for 0dB indication).
 - VR605: Bias current adjustment VR (for CrO₂ tape).
 - VR606: Bias adjustment control.
 - L1, 2: Bias leakage adjustment coil.
 - L3, 4: Recording equalizer adjustment coil.
 - Resistor values are in ohms (Ω), 1/4 watt unless specified otherwise.
 - K=1,000Ω.
 - Capacitor values are in microfarads (μF) unless specified otherwise.
 - P=Pic-farads.
 - All voltage values shown in circuitry are under no signal condition with volume control at minimum position.
 - For measurement, use VTVM.
 - The mark (▼) shows test point. ▼ = Test point 1.

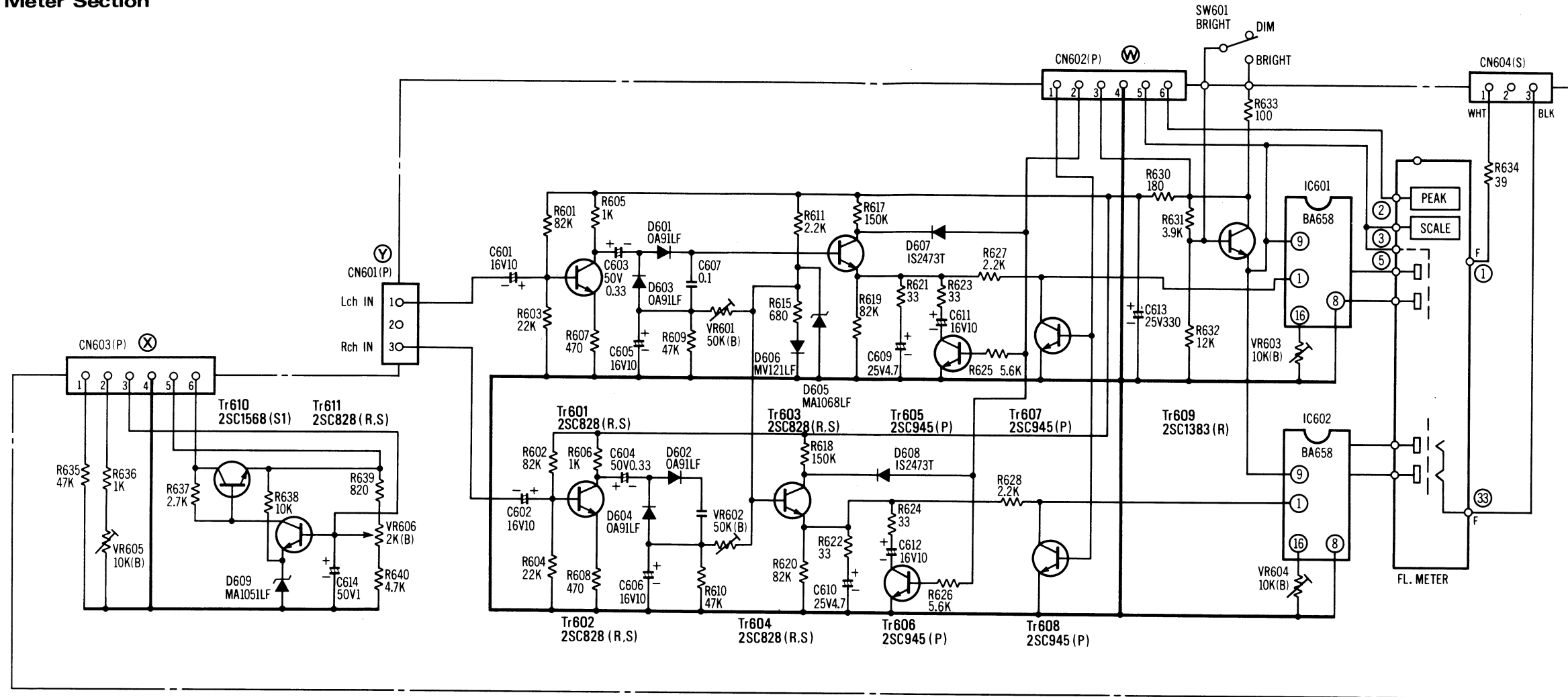


MAIN CIRCUIT BOARD

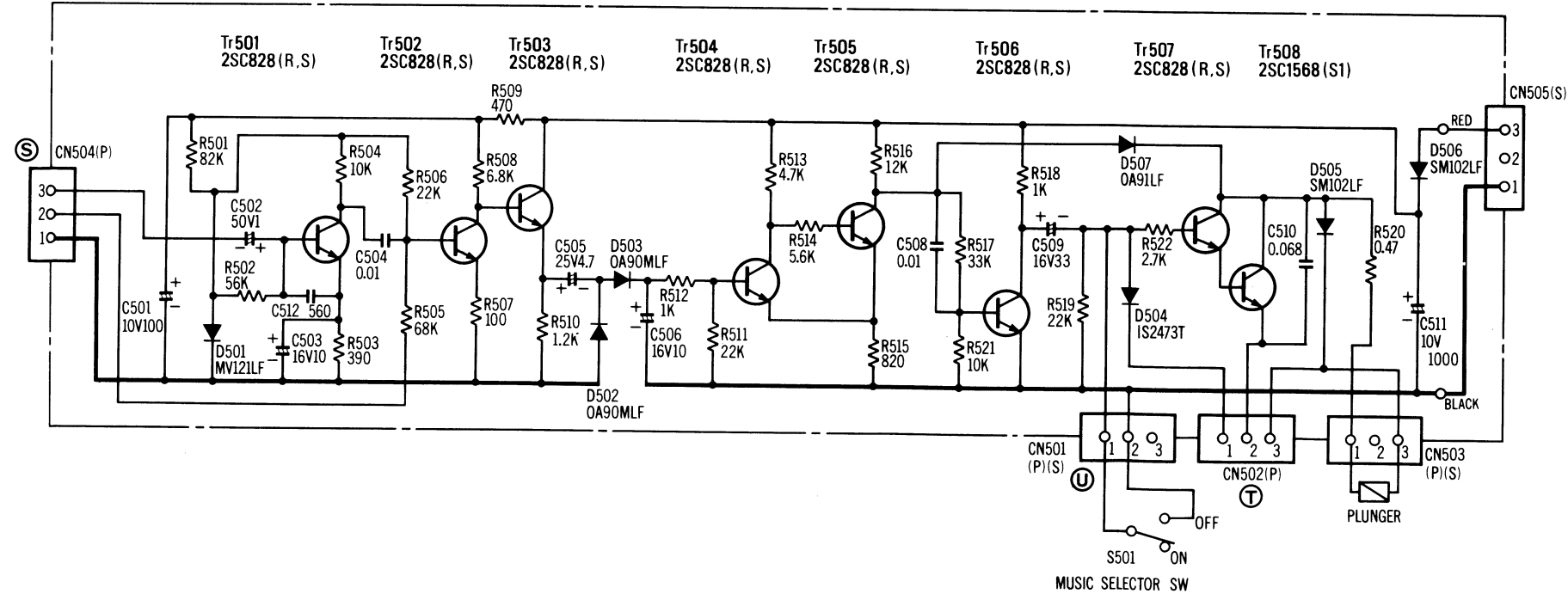


SCHEMATIC DIAGRAM MODEL RS-641

Meter Section



Control Section



NOTE: RESISTORS	CAPACITORS
ERD ... Carbon	ECG ... Ceramic
ERG ... Metal-oxide	ECK ... Ceramic
ERO ... Metal-film	ECC ... Ceramic
ERX ... Metal-film	ECF ... Ceramic
ERQ ... Fuse type metallic	ECQM ... Polyester
ERC ... Solid	ECOE ... Polyester
ERF ... Cement	ECQF ... Polypropylene
	ECE ... Electrolytic
	ECE ... Non polar electrolytic
	ECS ... Polystyrene
	ECS ... Tantalum

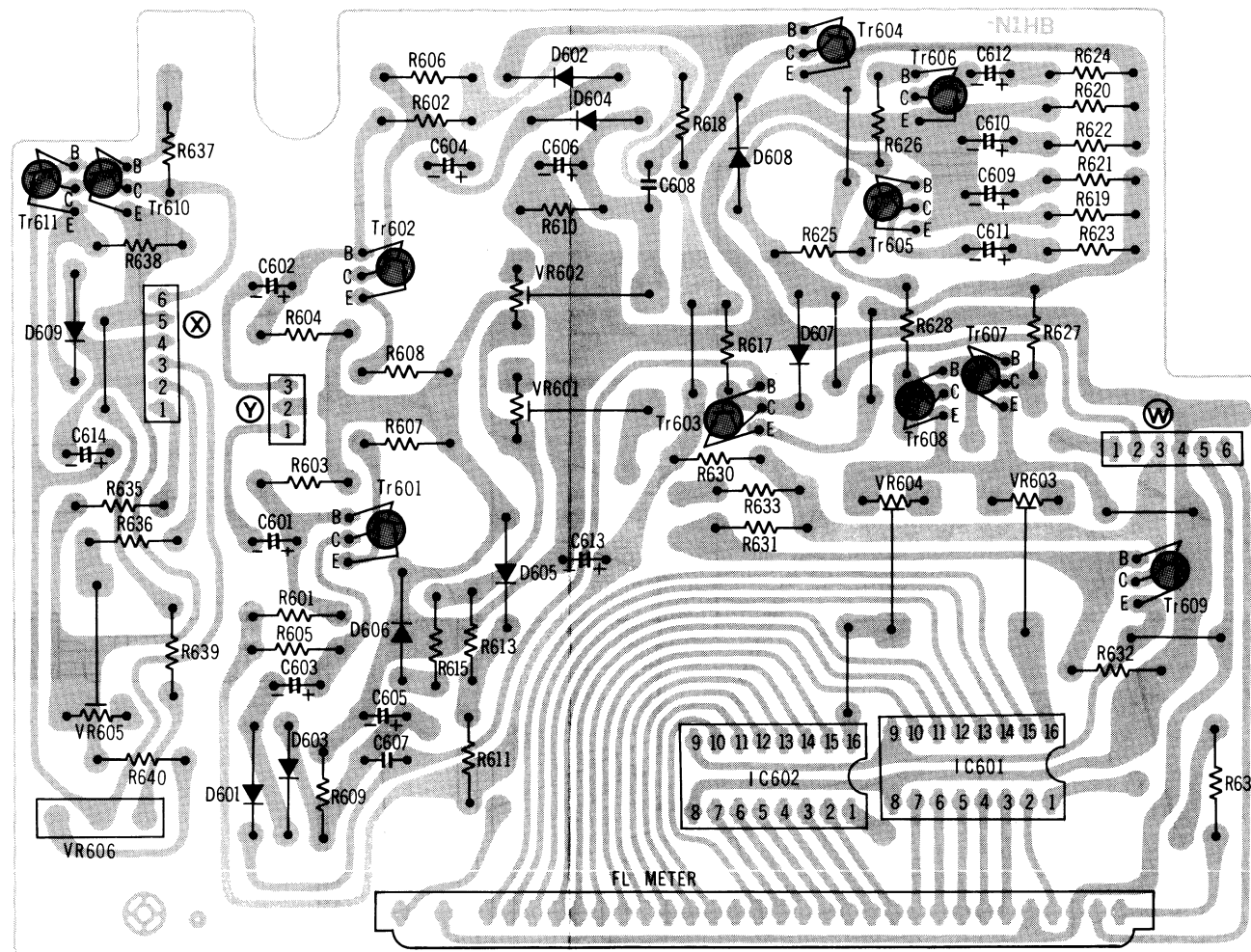
Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS			
R1, 2	ERD25TJ182	R231	ERD25TJ100
R3, 4	ERD25TJ333	R501	ERD25TJ823
R5, 6	ERD25TJ100	R502	ERD25TJ563
R7, 8	ERD25TJ333	R503	ERD25TJ391
R9, 10	ERD25TJ153	R504	ERD25TJ103
R11, 12	ERD25TJ223	R505	ERD25TJ683
R13, 14	ERD25TJ101	R506	ERD25TJ223
R15, 16	ERD25TJ184	R507	ERD25TJ101
R17, 18	ERD25TJ104	R508	ERD25TJ682
R19, 20	ERD25TJ183	R509	ERD25TJ471
R21, 22	ERD25TJ394	R510	ERD25TJ222
R23, 24	ERD25TJ331	R511	ERD25TJ223
R25, 26	ERD25TJ222	R512	ERD25TJ102
R27, 28	ERD25TJ561	R513	ERD25TJ472
R29, 30	ERD25TJ472	R514	ERD25TJ562
R31, 32	ERD25TJ562	R515	ERD25TJ821
R33, 34	ERD25TJ274	R516	ERD25TJ123
R35, 36	ERD25TJ273	R517	ERD25TJ333
R37, 38	ERD25TJ181	R518	ERD25TJ102
R39, 40	ERD25TJ181	R519	ERD25TJ223
R43, 44	ERD25TJ332	R520	ERX12ANJ847
R45, 46	ERD25TJ473	R521	ERD25TJ103
R47, 48	ERD25TJ104	R522	ERD25TJ272
R49, 50	ERD25TJ181	R601, 602	ERD25TJ823
R51, 52	ERD25TJ154	R603, 604	ERD25TJ223
R53, 54	ERD25TJ684	R605, 606	ERD25TJ102
R55, 56	ERD25TJ274	R607, 608	ERD25TJ471
R57, 58	ERD25TJ102	R609, 610	ERD25TJ473
R61, 62	ERD25TJ182	R611	ERD25TJ222
R63, 64	ERD25TJ101	R613	ERD25TJ182
	ERD25TJ681	R615	ERD25TJ681
		R617, 618	ERD25TJ154
		R619, 620	ERD25TJ823
		R621, 622, 623, 624	
		R625, 626	ERD25TJ330
		R627, 628	ERD25TJ562
		R630	ERD25TJ222
		R631	ERD25TJ181
		R632	ERD25TJ222
		R633	ERD25TJ123
		R634	ERG12ANJ390
		R635	ERD25TJ473
		R636	ERD25TJ102
		R637	ERD25TJ272
		R638	ERD25TJ103
		R639	ERD25TJ821
		R640	ERD25TJ472
VARIABLE RESISTORS			
VR1, 2	EVLS3AA00B54		
VR3, 4	EVLS3AA00B24		
VR5, 6	EWKN3AF21A24		
VR7, 8	EWKN3AF21A15		
VR9, 10	EVLS3AA00B54		
VR15, 16	EVLS3AA00B54		
VR17, 18	EVLS3AA00B15		
VR201	EVLS3AA00B14		
VR601, 602	EVLS3AA00B54		
VR603, 604, 605	EVLS3AA00B14		
VR606	EVHGXAF25B23		
CAPACITORS			
C5, 6	ECEA16Z10		

NOTE: 1. Symbols after Ref. No. indicate:
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 ○ for Australia
 □ for other European areas
 2. Indicated that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Part Name & Description
C7, 8	ECEA1CS221	C223	ECQM05223KZ	COMBINATION PART		
C9, 10	ECCD1H221K	C223	ECQM05103KZ	Z201	QCR0008T	Spark Killer
C11, 12	ECKD1H102MD	C224	ECEA1ES331	TRANSISTORS		
C13, 14	ECEA1HS100	C225	ECEA2AS010	Tr1, 2	2SC1383	Transistor
C15, 16	ECCD1H271K			Tr3, 4, 5, 6	2SC945	"
C17, 18	ECKD1H682MD	C226	ECEB1CS102	Tr11, 12	2SC1383	"
C19, 20	ECEA0JS471	C501	ECEA1AS101	Tr201	2SC1318	"
C21, 22	ECEA16Z10	C502	ECEA2AS010	Tr202	2SC1383	"
C23, 24	ECQM05103KZ	C503	ECEA1HS100	Tr203, 204, 205	2SC945	"
C25, 26	ECCD1H181K	C504	ECQM05103KZ	Tr206	2SA564	"
C27, 28	ECEA502R1	C505	ECEA16Z10	Tr207	2SC1568	"
C29, 30	ECQM05562JZ	C508	ECQM05103KZ	Tr501, 502, 503, 504, 505, 506, 507	2SC828	"
C31, 32	ECEA1HS100	C509	ECEA1CS330	Tr508	2SC1568	"
C33, 34	ECEA25Z47R	C510	ECQM05683KZ			
C35, 36	ECQM05472JZ					
C37, 38, 39, 40	ECEA1HS100	C511	ECEA1AS102			
C41, 42	ECQM05473KZ	C512	ECKD1H561KB			
C43, 44	ECQM05273JZ	C601, 602	ECEA1HS100			
C45, 46	ECEA1HS100	C603, 604	ECEA502R33			
		C605, 606	ECEA1HS100			
C47, 48	ECQM05104KZ	C607, 608	ECQM05104KZ			
C49, 50	ECEA502R33	C609, 610	ECEA1JS47R			
C51, 52	ECEA1CS221	C611, 612	ECEA1HS100			
C53, 54	ECEA1ES470	C613	ECEA1ES331			
C55, 56	ECEA502R33	C614	ECEA2AS010			
C57, 58	ECEA5021					
C59, 60, 63, 64	ECEA1HS100					
C65, 66	ECQM05473KZ					
C65, 66	ECQM05563KZ					
C71, 72	ECQM05104KZ					
C73, 74	ECQM05223KZ					
C73, 74	ECQM05393KZ					
C75, 76	ECQM05104KZ					
C77, 78	ECQM05683KZ					
C79, 80	ECQM05122KZ					
C81, 82	ECEA1HS100					
C83	ECEA1CS331					
C85, 86	ECEA2AS010					
C87, 88	ECEA1HS100					
C89, 90	ECEA1ES470					
C91, 92	ECEA1HS100					
C93, 94	ECEA1AS221					
C95, 96	ECQM05102KZ					
C95, 96	ECKD1H471KB					
C97, 98	ECKD1H561KB					
C99, 100	ECQM05473KZ					
C99, 100	ECQM05683KZ					
C201	EQS1332KZ					
C202	ECQM05104KZ					
C203	ECEA1CS331					
C204	ECEA1VS101					
C205, 206	ECEA1VS471					
C207	ECEA1VS102					
C208	ECEA1CS222					
C209, 210	ECEA1HS470					
C211	ECKD1H102MD					
C212	ECEA16M10					
C213	ECKD1H103ZF					
C215	ECEA1JS47R					
C216	ECEA502R47					
C217	ECQM05104KZ					
C218	ECQM05222KZ					
C219	ECQM05104KZ					
C220	ECQM05682JZ					
C221	ECQM05104KZ					
C222	ECQM05102KZ					

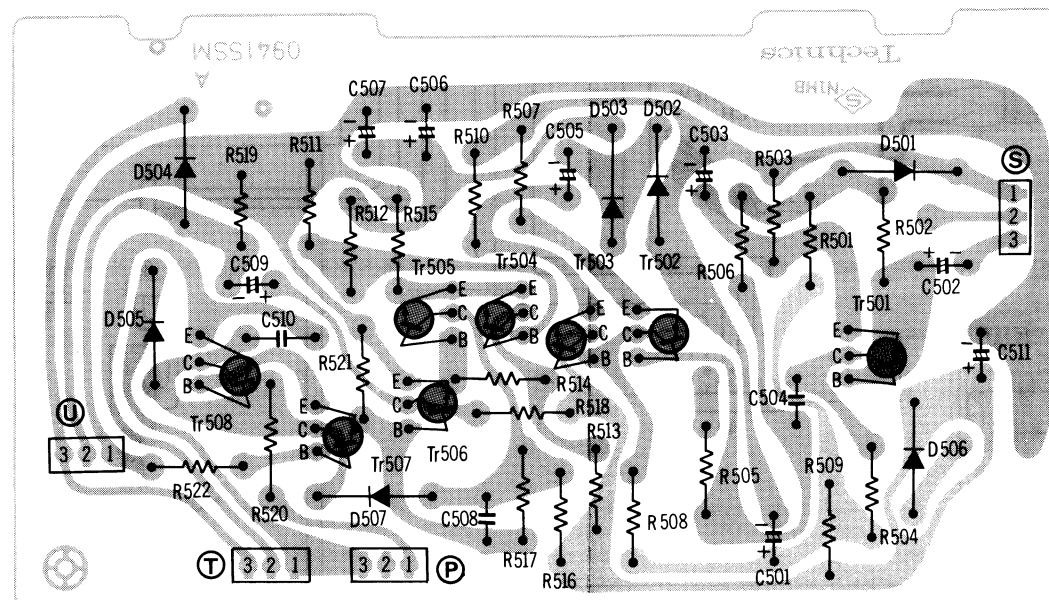
CIRCUIT BOARD

METER CIRCUIT BOARD

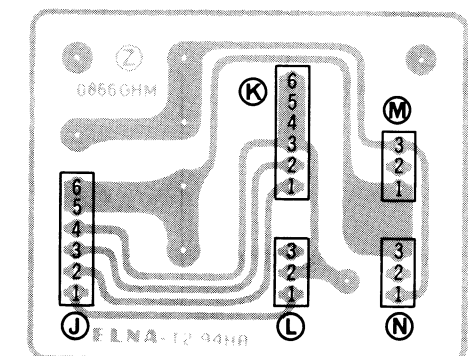


Ref. No.	Part No.	Part Name & Description
S205	QSR1407H	Rotary Switch (AC Voltage Selector)
S501, 601	ESB3910	Push Switch
PILOT LAMPS		
PL203	XAMQ22P500N	Pilot Lamp (for Record)
PL204	XAMQ34S600W	Pilot Lamp (for Mechanism)
PL205	XAMQ21P400N	Pilot Lamp (for Memory)
FUSES		
F201	XBAQ0008	Fuse (630mA)
F201	XBA2E03N55	Fuse (300mA)
F202	XBAQ0004	Fuse (1A)
F203	XBAQ0003	Fuse (500mA)
F204	XBAQ0007	Fuse (400mA)

CONTROL CIRCUIT BOARD

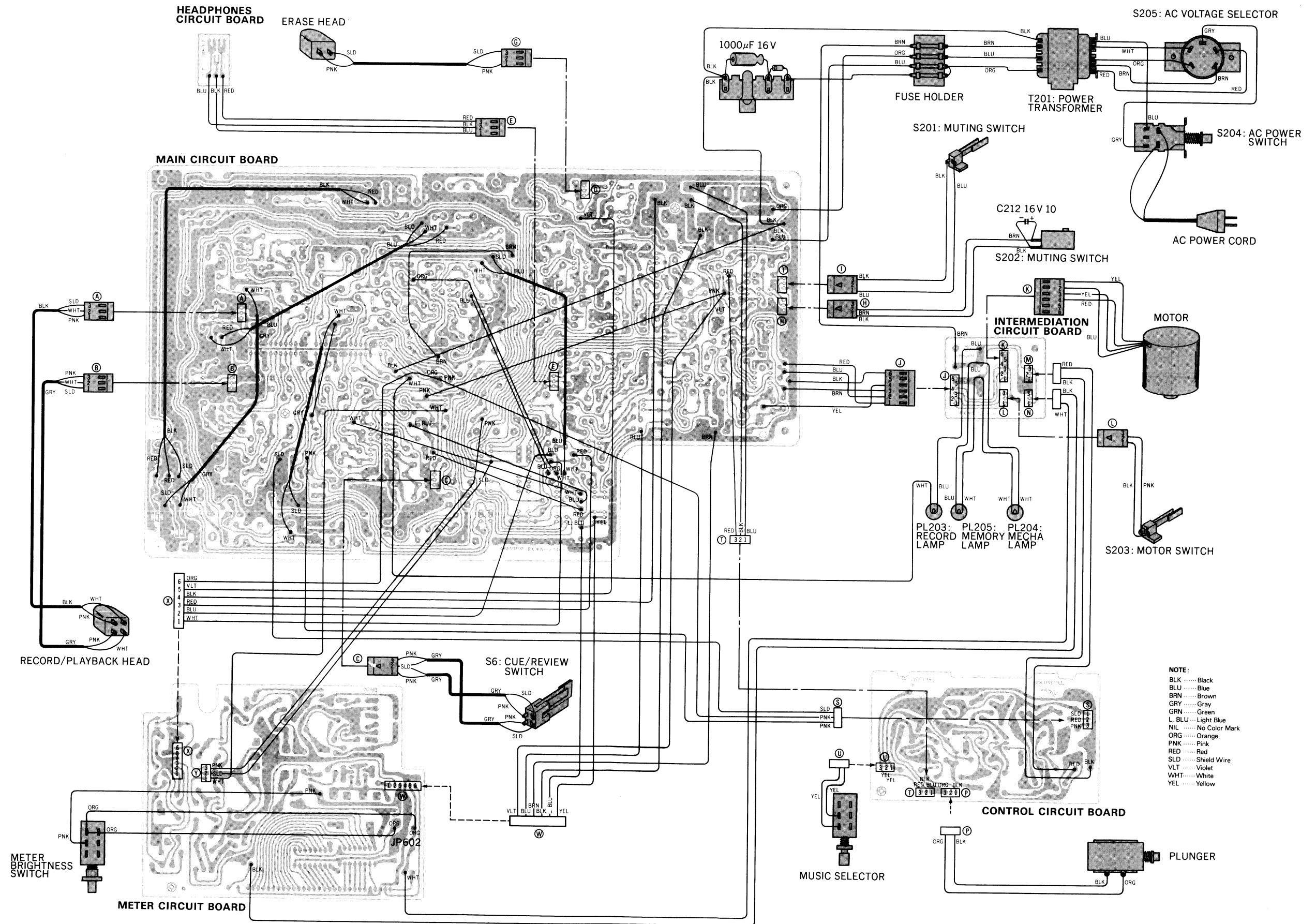


INTERMEDIATION CIRCUIT BOARD

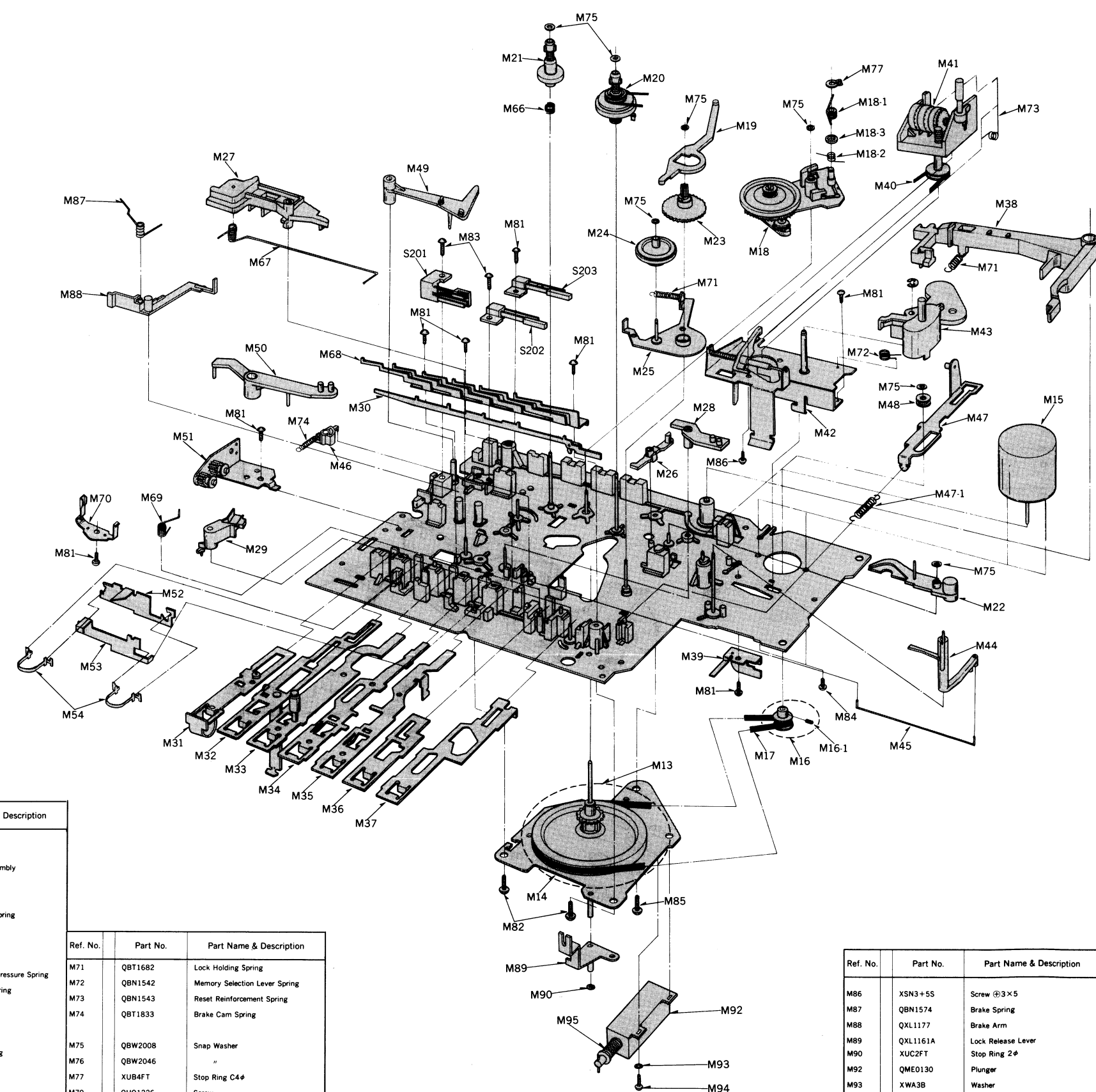
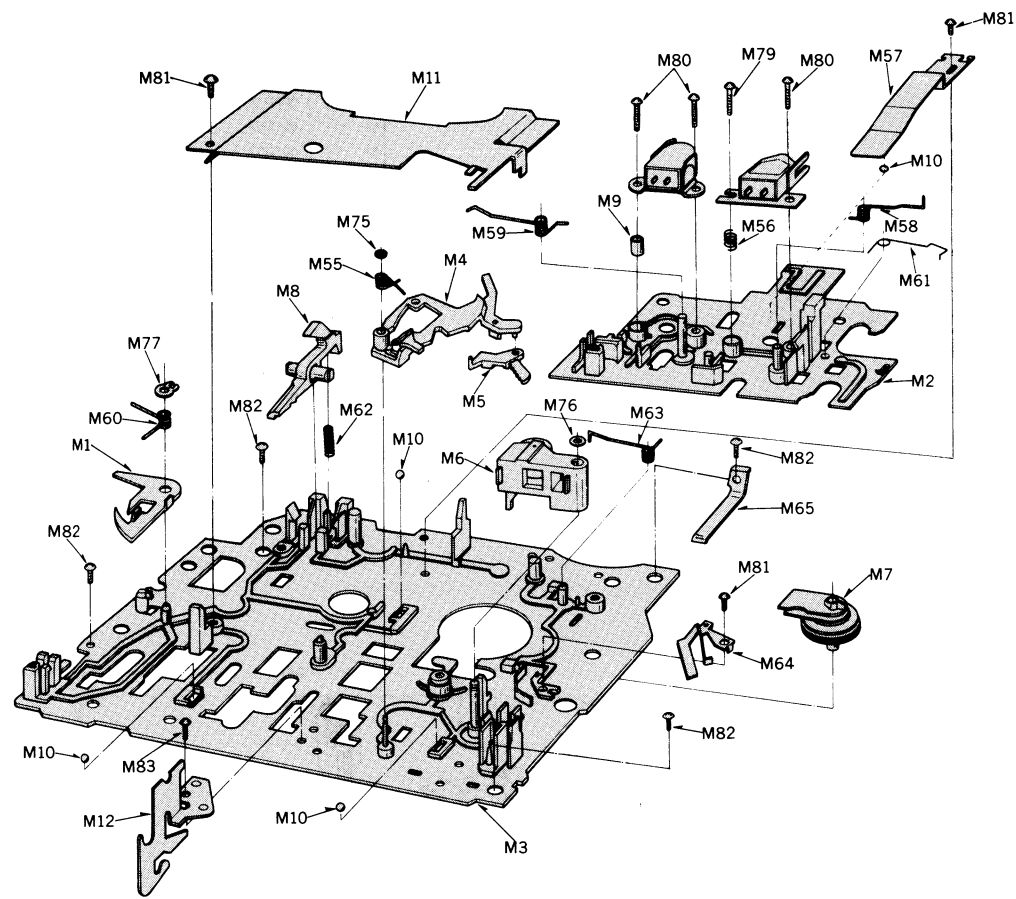


NOTE:
The circuit shown in red on the conductor is B circuit.

WIRING CONNECTION DIAGRAM MODEL RS-641



EXPLODED VIEWS



NOTE: 1. Symbols after Ref. No. indicate:
● for United Kingdom
○ for Australia
□ for other European areas
△ for other areas without European
□ for PX
Ref. No. without symbols apply to all areas.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS					
M1	QML2898	Pause Lock Plate	M23	QDG1096	Cam Gear
M2	QMK1612	Head Base Plate	M24	QXG1026	Auto-Stop Gear Assembly
M3	QXK1951	Upper Base Plate Assembly	M25	QXL1037	Gear Lever Assembly
M4	QML3047	Obstruction Lever	M26	QML3042	Auto-Stop Obstruction Lever
M5	QML3048	Driving Lever	M27	QML3217	Pause Lever
M6	QXL1057	Pressure Roller Lever Assembly	M28	QML3049	Cue Lever
M7	QI10098	Takeup Idler Assembly	M29	QML3294	Lock Release Arm
M8	QML3051	Erase Safety Lever	M30	QXR0275	Lock Rod Assembly
M9	QMC0061	Erase Head Spacer	M31	QXR0342	Pause Rod Assembly
M10	QDK1012	Steel Ball 2.5φ	M32	QXR0343	Record Rod Assembly
M11	QMF1939	Chassis Cover-A	M33	QXR0344	Playback Rod Assembly
M12	QMA3186	Fulcrum Angle	M34	QMR1624	Rewind Rod-A
M13	QIF0131	Flywheel	M35	QMR1623	Fast Forward Rod-A
M14	QIH0275	Flywheel Retainer Assembly	M36	QMR1622	Stop Rod-A
M15	MHNBE2RSD	Motor	M37	QMR1621	Eject Rod-A
M16	QIP0567	Motor Pulley Assembly	M38	QML3038	Switch Arm
M16-1	XSN2+3	Screw 2×3	M39	QMA3173	Connection Wire Holding Angle
M17	QDB0241	Flywheel Belt	M40	QDB0240	Counter Belt
M18	QXL1136	Fast Forward Arm Assembly	M41	QXC0017	Tape Counter
M18-1	QBN1517	Fast Forward Spring	M42	QXA0649	Counter Angle Assembly
M18-2	QBN1559	Fast Forward Arm Spring	M43	QXL1135	Memory Selection Lever (for Silver Face Unit)
M18-3	QMC0080	Collar	M43	QXL1151	Memory Selection Lever (for Black Face Unit)
M19	QML3040	Cam Lever	M44	QML3205	Connection Lever
M20	QID0067	Takeup Reel Table Assembly	M45	QBS1113	Connection Wire
M21	QID0084	Supply Reel Table Assembly	M46	QMD0016	Rewind Brake Cam
M22	QXL1055	Auto-Stop Lever Assembly	M47	QXR0345	Eject Rod-B
			M47-1	QBT1619	Idler Spring
			M48	QBJ2088	Counter Pulley

Ref. No.	Part No.	Part Name & Description
M49	QML3206	Muting Arm
M50	QML3207	Muting Lever
M51	QXG1031	Damper Gear Assembly
M52	QMR1628	Obstruction Rod-A
M53	QMR1629	Obstruction Rod-B
M54	QBP1770	Obstruction Rod Spring
M55	QBN1515	Connection Spring
M56	QBC1278	Head Spring
M57	QBP1773	Head Base Plate Pressure Spring
M58	QBN1488	Pressure Roller Spring
M59	QBN1481	Playback Spring
M60	QBN1480	Pause Lock Spring
M61	QBN1514	Timer Spring
M62	QBC1193	Safety Lever Spring
M63	QBN1513	Idler Spring
M64	QBP1723	Click Spring
M65	QBP1777	Holder Reinforcement Spring
M66	QBC1279	Back Tension Spring
M67	QBN1555	Pause Spring
M68	QBP1664	Operation Rod Spring
M69	QBN1531	Lock Release Arm Spring
M70	QBP1662	Lock Rod Spring

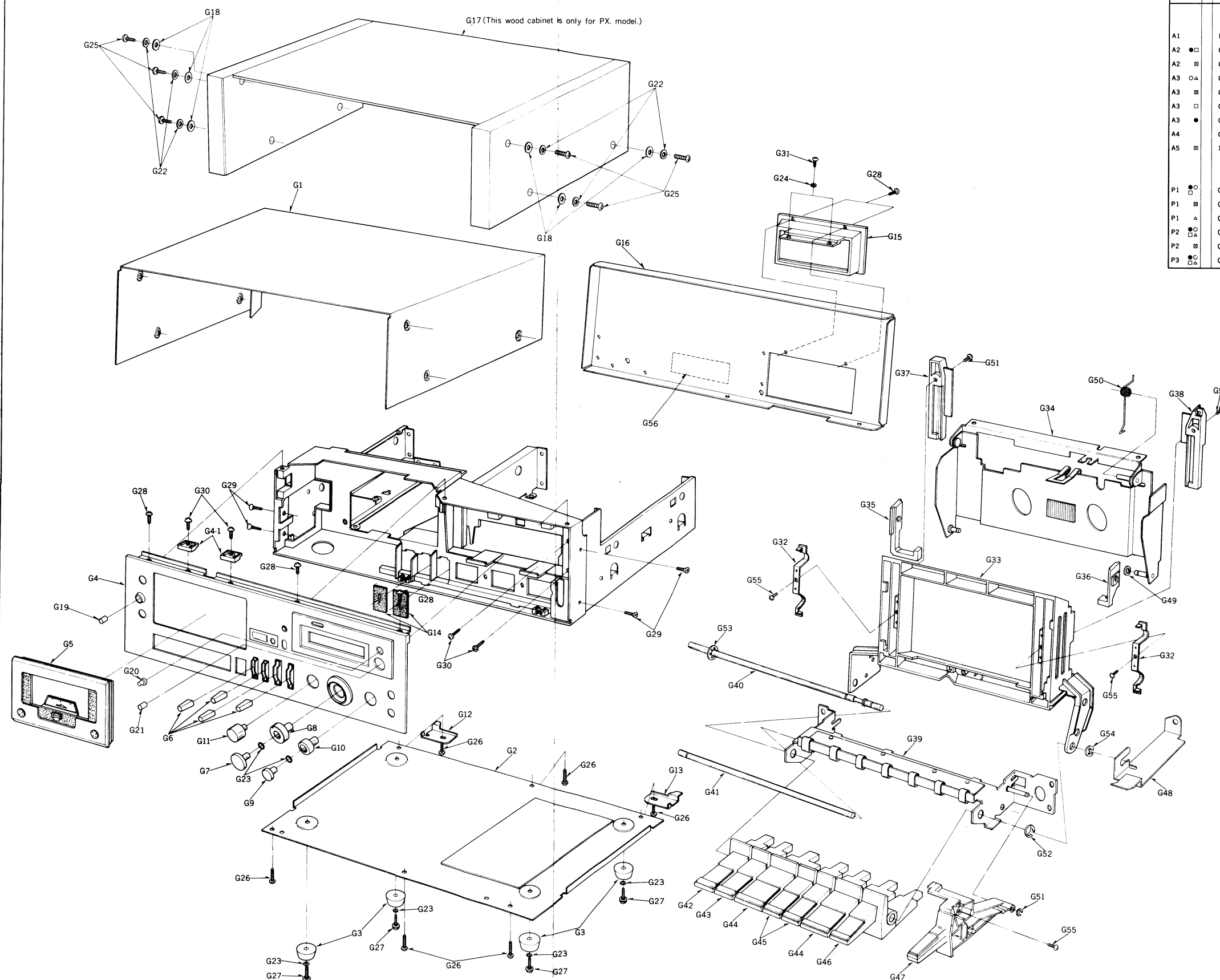
Ref. No.	Part No.	Part Name & Description
M71	QBT1682	Lock Holding Spring
M72	QBN1542	Memory Selection Lever Spring
M73	QBN1543	Reset Reinforcement Spring
M74	QBT1833	Brake Cam Spring
M75	QBW2008	Snap Washer
M76	QBW2046	"
M77	XUB4FT	Stop Ring C4φ
M79	QHQ1226	Screw
M80	XSN2+10	Screw 2×10
M81	XTN26+5B	Tapping Screw 2.6×5
M82	XTN3+10B	Tapping Screw 3×10
M83	XTN26+8B	Tapping Screw 2.6×8
M84	XSN26+3	Screw 2.6×3
M85	XTN3+20B	Tapping Screw 3×20

Ref. No.	Part No.	Part Name & Description
M86	XSN3+5S	Screw 3×5
M87	QBN1574	Brake Spring
M88	QXL1177	Brake Arm
M89	QXL1161A	Lock Release Lever
M90	XUC2FT	Stop Ring 2φ
M92	QME0130	Plunger
M93	XWA3B	Washer
M94	XSN3+8S	Screw 3×8
M95	QBC1317	Plunger Spring

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 ⊞.....for PX
 Ref. No. without symbols apply to all areas.

CABINET PARTS

Ref. No.	Part No.	Part Name & Description
CABINET PARTS		
G1	QGC1079	Case Cover
G1	QGC1086	"
G2	QGC1080	Bottom Cover
G3	QKA1065	Rubber Foot
G4	QYP0754	Front Panel Assembly (for Silver Face Unit)
G4	QYP0755	Front Panel Assembly (for Black Face Unit)
G4	QYP0756	Front Panel Assembly (for Silver Face Unit)
G4-1	QKJ0235	Stopper
G5	QYF0308	Cassette Lid Assembly (for Silver Face Unit)
G5	QYF0309	Cassette Lid Assembly (for Black Face Unit)
G5	QYF0337	Cassette Lid Assembly (for Silver Face Unit)
G6	QYT0461	Lever Knob
G7	QYT0458	Volume Knob-A
G8	QYT0457	Volume Knob-B
G9	QYT0459	Volume Knob-C
G10	QYT0460	Volume Knob-D
G11	QYT1387	Volume Knob-E
G12	QMA3261	Reinforcement Angle-A
G13	QMA3262	Reinforcement Angle-B
G14	QBH0060	Spacer
G15	QGC2769	Jack Board Ornament
G16	QGC1094	Back Cover
G16	QGC1092	"
G17	QKW1286	Wood Cabinet
G18	QBK7143	Fiber Washer
G19	QXB0534	Music Select Button
G20	QXB0533	Bright Button
G21	QYT0480	Bias Adjust
G22	XWA4B	Spring Washer
G23	XWA4B	"
G24	XWA3B	"
G25	XSN4+8BVS	Screw $\phi 4 \times 8$
G26	XTN3+15B	Tapping Screw $\phi 3 \times 15$
G27	XSN4+10S	Screw $\phi 4 \times 10$
G28	XTN3+10B	Tapping Screw $\phi 3 \times 10$
G29	XSS3+6S	Screw $\phi 3 \times 6$
G30	XSN3+8S	Screw $\phi 3 \times 8$
Cassette Holder Section		
G32	QBP1771	Holder Spring
G33	QKF6008	Cassette Holder
G34	QXH0271	Chassis Cover Assembly
G35	QKF6010	Holder Piece-L
G36	QKF6009	Holder Piece-R
G37	QMG0050	Holder Slider-L
G38	QMG0049	Holder Slider-R
G39	QXA0637	Push Button Holding Angle
G40	QMN2240	Push Button Shaft-A
G41	QMN1861	Push Button Shaft-B
G42	QGO1473	Push Button (PAUSE)
G43	QGO1474	Push Button (REC)
G44	QGO1476	Push Button (PLAY, STOP)
G45	QGO1477	Push Button (FF, REW)
G46	QGO1475	Push Button (EJECT)
G47	QXB0556	Timer Button Assembly
G48	QMA3269	Reinforcement Angle
G49	QBW2017	Washer
G50	QBN1554	Chassis Cover Spring
G51	XUC25FT	Stop Ring 2.5 ϕ
G52	XUC4FT	Stop Ring 4 ϕ
G53	QNQ1080	Stop Ring
G54	XUC3FT	Stop Ring 3 ϕ
G55	XTN26+5B	Screw $\phi 2.6 \times 5$
G56	QGS2578	Name Plate
G56	QGS2579	"
G56	QGS2580	"
G56	QGS2581	"



NOTE: 1. Symbols after Ref. No. indicate:
 ●.....for United Kingdom
 ○.....for Australia
 □.....for other European areas
 △.....for other areas without European
 ⊞.....for PX
 Ref. No. without symbols apply to all areas.

Ref. No.	Part No.	Part Name & Description
ACCESSORIES		
A1	RP023A	Connection Cord
A2	QFT6TCJNTBFZ	Demonstration Tape
A2	QFT1TCCPTRJZ	"
A3	QQT2324	Instruction Book
A3	QQT2322	"
A3	QQT2320	"
A3	QQT2321	"
A4	QJP0603S	Plug Adaptor
A5	XBA2E03NS5	Fuse
PACKINGS		
P1	QPN3717	Inside Carton
P1	QPN3718	"
P1	QPN3733	"
P2	QPA0369	Inner Cushion-A (Left)
P2	QPA0402	"
P3	QPA0370	Inner Cushion-B (Right)

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